Panasonic

S-VHS-Compact Movie

NV-MS90 Series

Operating Instructions

S-VHS C 625 VHS PAL

Before attempting to connect, operate or adjust this product,
please read these instructions completely.

VQT3569-1

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IMPORTANT

Your attention is drawn to the fact that recording of pre-recorded tapes or discs or other published or broadcast material may infringe copyright laws.

WARNING

TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

NV-MS90A: Australian model
NV-MS90EA: New Zealand model

S-VHS-C Movie NV-MS90

- **The rating plate is on the bottom side of the Movie Camera.**

AC Adaptor VW-AMC2

- **The rating plate is on the bottom side of the unit.**

FOR YOUR SAFETY

■ **DO NOT REMOVE THE OUTER COVER.**

To prevent electric shock, do not remove the cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

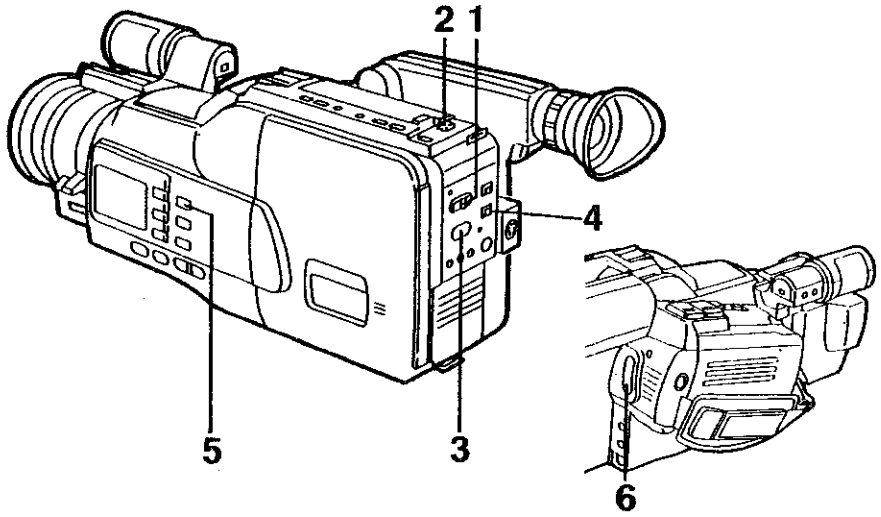
HQ (High Quality) Picture System

Video recorders carrying the HQ symbol mark feature the new VHS High Quality Picture System. This system assures complete compatibility with VTRs that use the conventional VHS system.

Hi-Fi

Easy Operations

Camera Recording



1 Turn the Movie Camera on.

2 Set the Camera/VTR Selector Switch to "CAMERA REC".

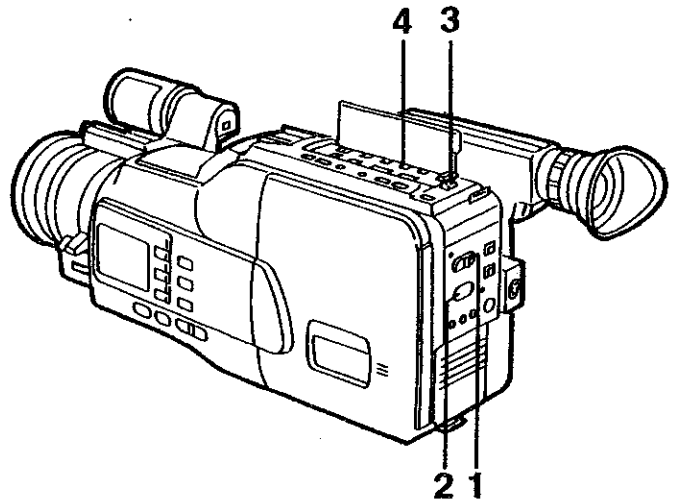
3 Insert a Video Cassette.

4 Set the Recording Speed Selector to "SP" or "LP".

5 Push the full Auto Button.
The settings made in this way are indicated in the LCD Display as follows:
FOCUS: [A] (Auto)
WHITE BALANCE: [A] (Auto)
SHUTTER SPEED: [NOR] (1/50 Normal Mode)
TIMER: [OFF] (Off)
S-VHS: [A] (Auto)

6 Press the Start/Stop Button.
- Recording starts.
- Press this button again to stop recording.

Playback



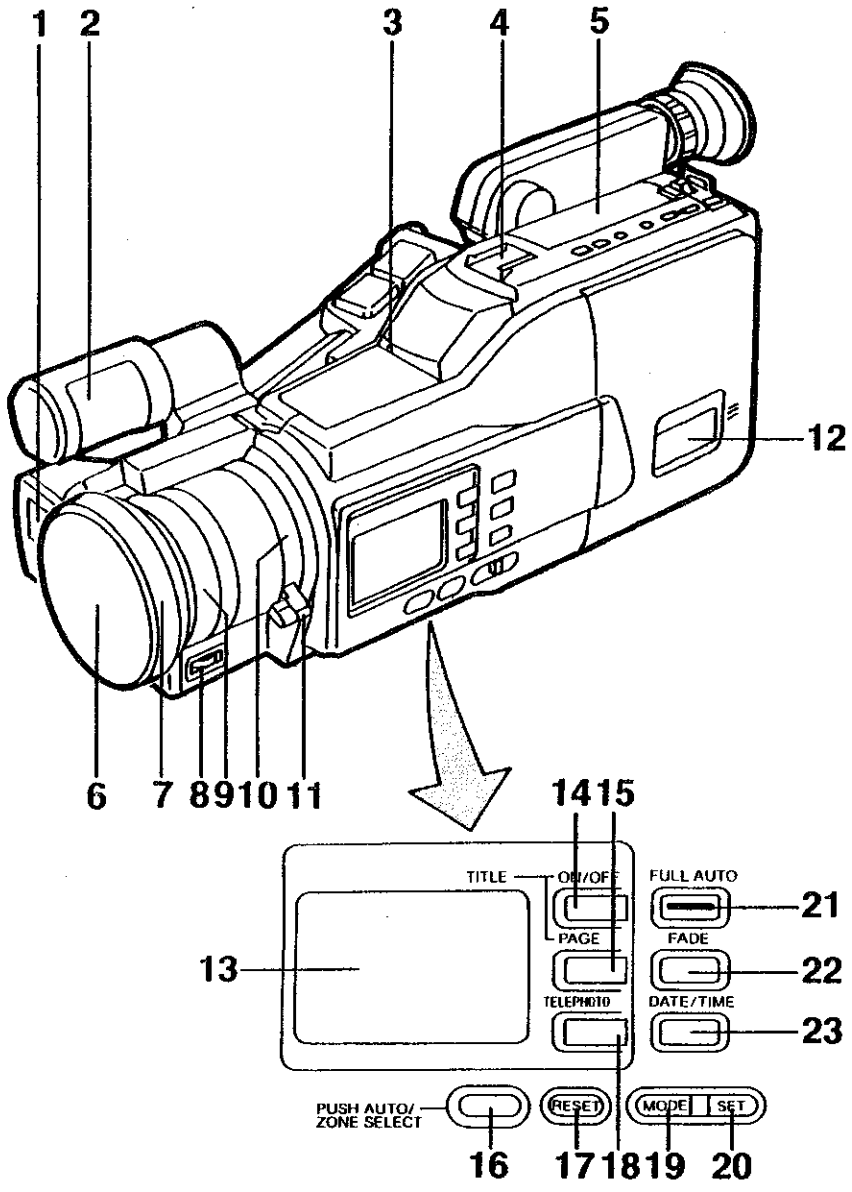
1 Turn the Movie Camera on.

2 Insert the recorded cassette.

3 Set the Camera/VTR Selector Switch to "VTR PLAY".

4 Press the Play Button.
- Playback starts.
- Press the Stop Button to stop playback.

Controls and Components



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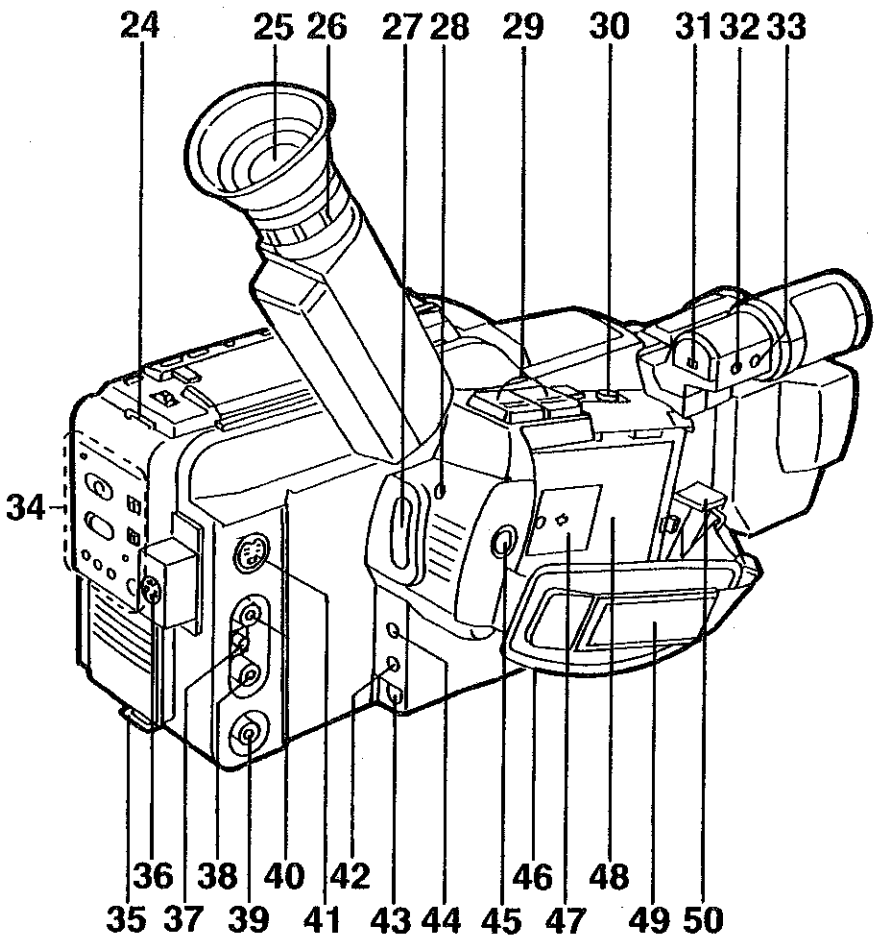

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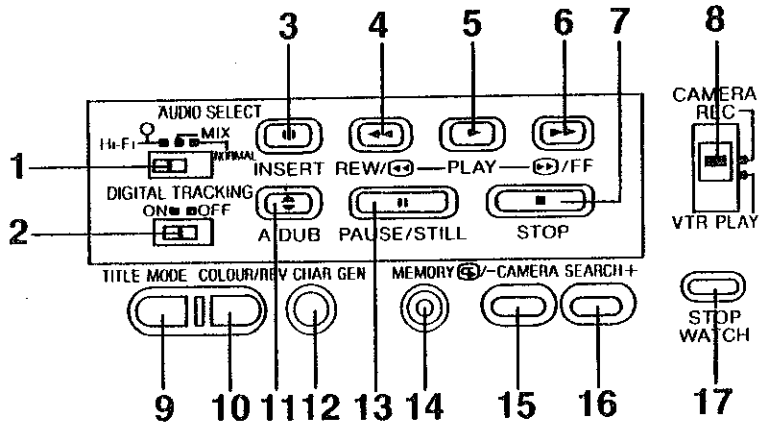
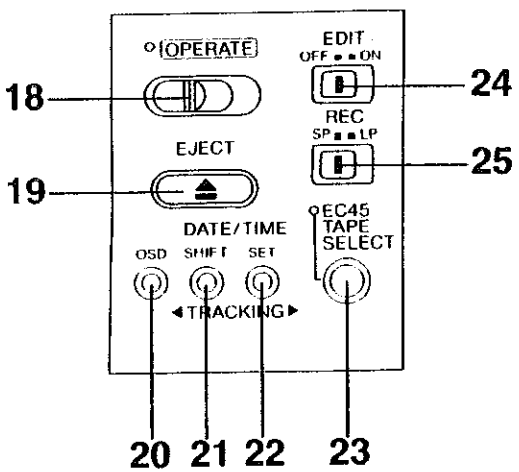
5 General Operation Controls



34 Rear Panel Controls



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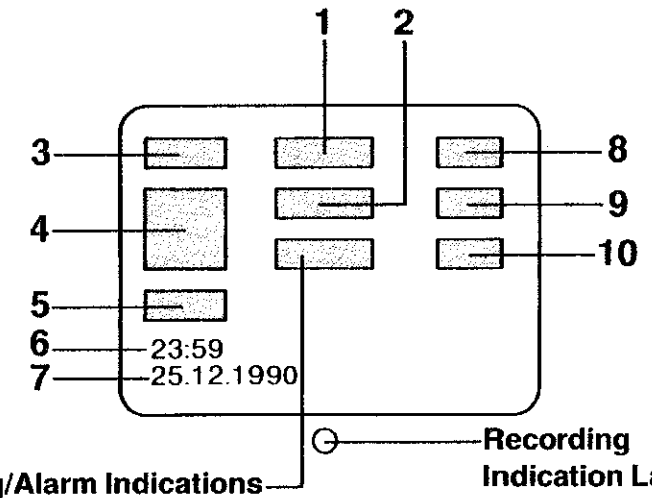
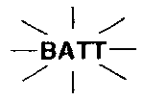
Indications in the Electronic Viewfinder (EVF)

The following indications are displayed in the Electronic Viewfinder (EVF) to inform you of the conditions of the Movie Camera.



Warning/Alarm Indications

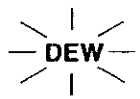


There is little battery power left. Movie Camera will be turned off in a few minutes. Replace the battery pack by a fully recharged one.

It is impossible to record because the erasure prevention tab of the cassette is not intact.

END

During recording, the tape has almost reached its end. Replace the tape with a new one. The indication will remain lit when the tape has reached its end.



When condensation has formed inside the Movie Camera, the "DEW" indication will flash and a few seconds later, the unit itself off.

Video Head Clogging (see page 38.)

1 Remaining Battery Power/Index Indication

E---F	The "▬" indications begin to disappear from right to left as the power of the Battery Pack weakens.
INDEX	This indication flashes when a recording is started and it indicates that an index signal is being recorded.

2 Counter Indication

M0501	Tape Counter
1:23	Lap Time Counter

3 Tape Remaining Indication

4 Digital Memory Indication

P1	Page Indication
WHT	Colour Indication
WIPE ↑	Mode Indication (No indication in normal mode.)

5 Self-Timer/Interval Indication

SELF-20S	Self-timer recording for 20 seconds
SELF-END	Self-timer recording until the end of the tape.
INTERVAL	Recordings of approx. 1 second will be made at 5-second intervals.

6 Time Indication

7 Date Indication

8 Tape Running Indications

REC	Recording mode
PAUSE	Recording Pause mode, Rec Review
▷	Play mode, Camera Search (In forward direction)
II	Still mode
▷▷	Fast Froward/Cue mode
◁◁	Rewind/Review mode, Camera Search (In reverse direction)
INST▷	Insert Editing mode
INST II	Insert Editing Pause mode
A.DUB▷	Audio Dubbing mode
A.DUB II	Audio Dubbing Pause mode

9 S-VHS System Indications

S	S-VHS System
" "	VHS System

Recording Mode Indications

SP	SP mode
LP	LP mode

10 High Speed Shutter Mode Indications

1/120	1/120 sec.
1/250	1/250 sec.
1/500	1/500 sec.
1/1000	1/1000 sec.
1/2000	1/2000 sec.

Manual White Balance Indications

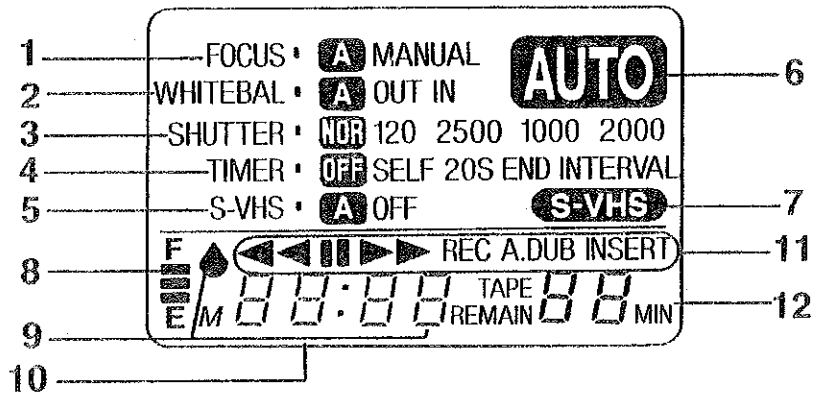
OUT	Outdoor
IN	Indoor

Telephoto Indication

TELE	Telephoto mode

- Some of the above indications may light up alternately at the same place in the EVF to indicate the corresponding operating condition or warnings.

Indications in the LCD Display



1 Focus Mode Indications

[A]: Auto Focus
MANUAL: Manual Focus

2 White Balance Indications

[A]: Auto
OUT: Outdoor
IN: Indoor

3 Shutter Speed Indications

[NOR]: Normal Speed
120: 1/120 sec.
250: 1/250 sec.
500: 1/500 sec.
1000: 1/1000 sec.
2000: 1/2000 sec.

4 Self-Timer/Interval Indications

[OFF]: Off
SELF 20S: Self-timer recording for 20 seconds
SELF END: Self-timer recording until the end of the tape
INTERVAL: Recordings of approx. 1 second will be made at 5-second intervals.

5 S-VHS System Indications

[A]: Auto
[OFF]: To make a recording in the VHS format on an S-VHS-C cassette tape.

6 Full Auto Indication

7 S-VHS Mode Indication

8 Remaining Battery Power Indications

The "▬" indications begin to disappear from top to bottom as the power of the Battery Pack weakens.

9 Dew Indication (💧)

10 Counter Indications

M0501: Tape Counter
1:23: Lap Time Counter

11 Tape Running Indications

▶ REC: Recording mode
❚❚ REC: Recording Pause mode
▶: Play mode, Camera Search (in forward direction)
❚❚: Still mode
◀◀: Rewind/Review mode, Camera Search (in reverse direction)
▶▶: Fast Forward/Cue mode
▶ INSERT: Insert Editing mode
❚❚ INSERT: Insert Editing Pause mode
▶ A.DUB: Audio Dubbing mode
❚❚ A.DUB: Audio Dubbing Pause mode

12 Tape Remaining Indication

Accessories

Standard Accessories

AC Adaptor
Battery Pack
RF Adaptor
Shoulder Strap
System Carrying Case
S-VHS-C Video Cassette
Cassette Adaptor
AV Output Cable
Coaxial Cable
Battery for Clock Operation
DC Input Cable
S-Video Cord
Battery for Cassette Adaptor Operation
Shoe Adaptor

Optional Accessories

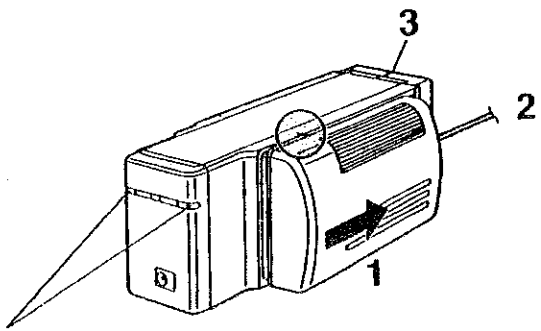
Pause Remote Control Unit (VW-RM1)
Character Generator (VW-CG2)
Car Battery Cord (VW-ACC5)
Handgrip (VW-GPC1E)
Soft Case (VW-CB5E)

Information for your safety.

CAUTION: TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD AND ANNOYING INTERFERENCE, USE THE RECOMMENDED ACCESSORIES ONLY.

Battery Pack

Charging



Charging Indicator Lamps

1 Attach the Battery Pack.
(Align the "▬" marks and slide the Battery Pack in the direction of the arrow.)

2 Connect the AC Adaptor to the Mains.

3 Turn the power on.

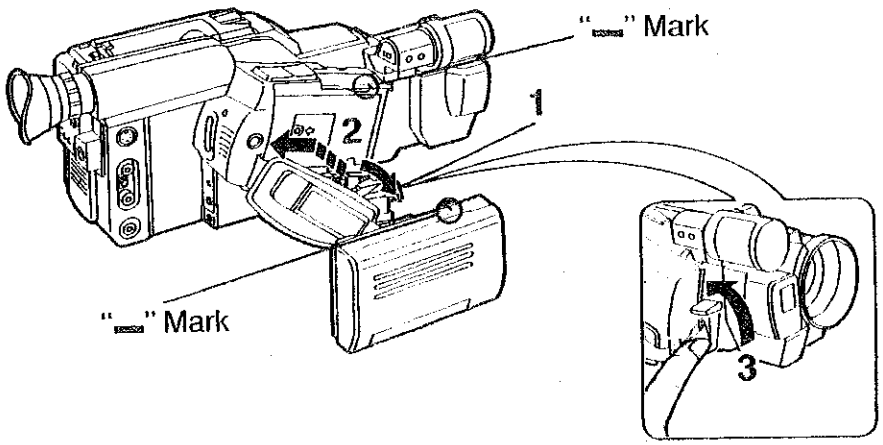
•Charging Indicator Lamps

Lit	The Battery Pack is being charged.
Not lit	Charging has been completed.
Flashing	The Battery Pack is in the waiting condition for charging.

Note:

- The charging takes about 110 minutes.
- The Movie Camera can be used continuously for approx. 60 minutes with a fully charged Battery Pack.
- When charging the 2 Battery Packs simultaneously, one charging indicator lamp will be lit and the other one will be flashing. After the charging of the first Battery Pack is completed, the second one will be charged.

Attaching



1 Pull the Battery Locking Lever forward and turn it down.

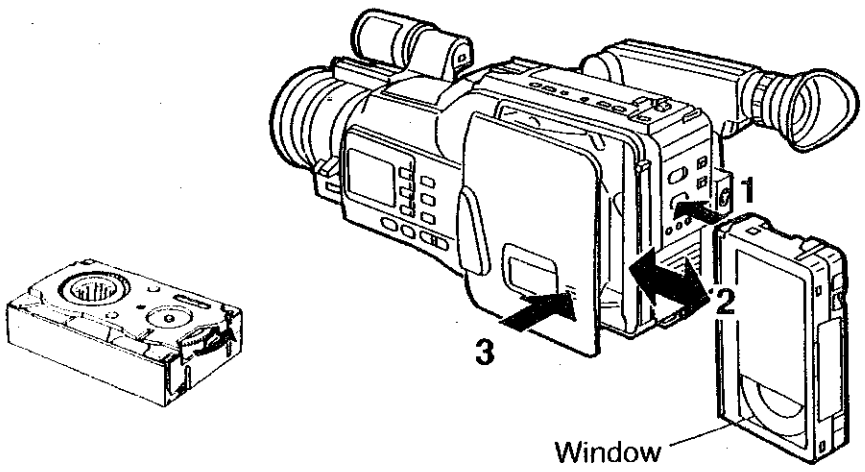
2 Align the "▬" marks and slide the Battery Pack backward (⇐).

3 Hold the part of the Battery Locking Lever where the belt is attached and turn it up until it locks with a click.

Caution:

- Wait about 10 seconds after turning the Movie Camera off, before removing the Battery Pack.
- If the Battery Pack is removed during recording or playback, the tape remains wound around the video head cylinder and could become damaged.

Video Cassette



Inserting the Video Cassette

Before Inserting the Cassette

Make sure that the tape is not loose, If it is loose, pull it in by turning the cog wheel on the side of the cassette in the direction of the arrow.

1 Press the Eject Button.

2 Insert the video cassette into the cassette compartment with its window facing outside.

3 Push the cassette compartment cover inward, until it locks with a click.

Removing a Video Cassette

1 Press the Eject Button.

2 Pull out the video cassette.

3 Push the cassette compartment cover inward, until it locks with a click, to close the cassette compartment.

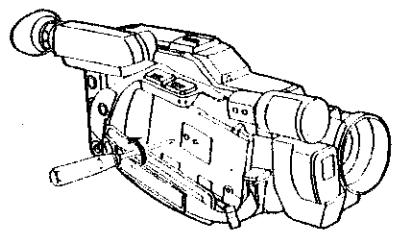
Note:

- Use S-VHS-C/VHS-C video cassettes only.

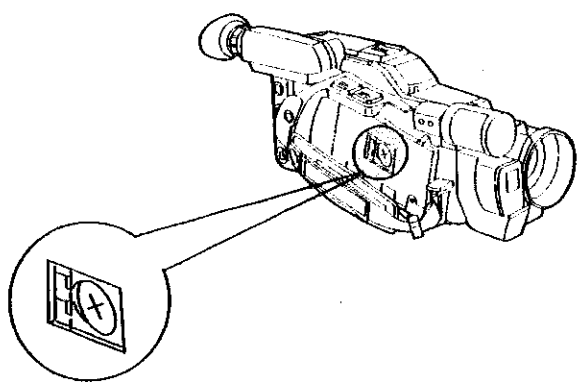
Setting the Clock

How to Insert the Battery for the Clock Operation

1 Remove the lid.



2 Insert the "CR2032" size battery with polarities (+ and −) aligned correctly and then replace the lid.



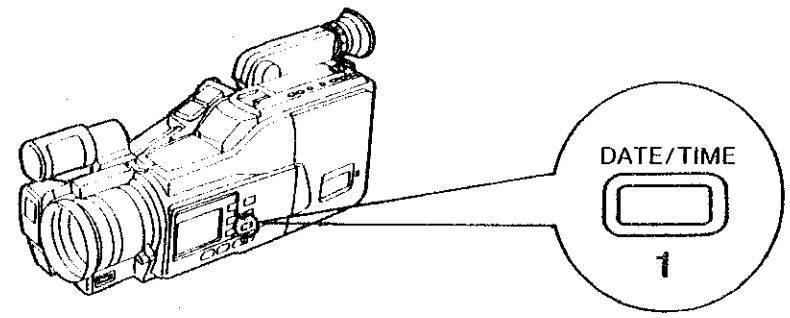
Note:

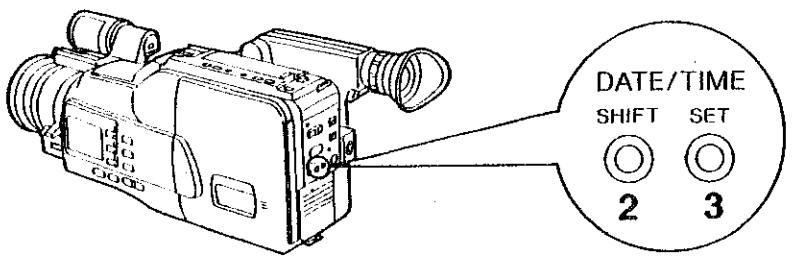
- This battery is necessary for the Date & Time, Title, S-VHS and White Balance modes to be memorized by the Movie Camera.
- If the battery is not inserted or if it is exhausted, the indication "BACKUP" in the EVF will flash for approximately 10 seconds when turning the Movie Camera on.
- When replacing the battery while the Time & Date Indications are still correct, connect the Movie Camera to the AC Adaptor for the duration of the battery replacement so that the time will remain unchanged.

CAUTION FOR BATTERY REPLACEMENT

- The life of the battery is about one year. Inspect and if necessary, replace the Battery once a year.
- Load the new battery with its polarities (+ and −) aligned correctly.
- Remove spent battery immediately and dispose of it.
- Do not try to short-circuit, recharge or heat the battery and do not throw it into a fire.

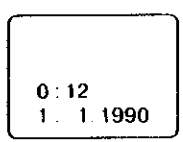
Setting of the Date and Clock





1 When the Date/Time Selector Button is pushed, the indication shown on the right will appear in the EVF.

- If no battery is inserted, the indication "BACKUP" will light up.



2 When the Shift Button is kept pressed for more than about 2 seconds, the "Year" portion will start to flash. Then, at every press of the shift Button, the items to be set will flash in the following sequence.

Year→Month→Date→Hour→Minute→**Year**→...

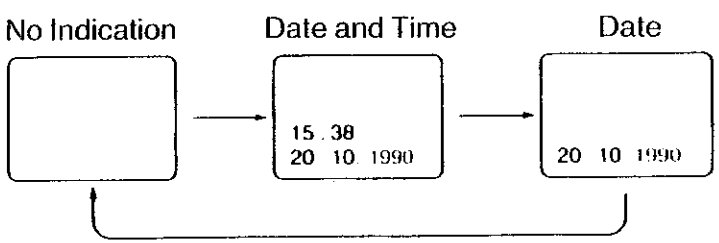
3 When the Set Button is pushed, the flashing portion displayed will be changed in the following sequence.

YEAR: **1990**→1991→ ..... →2089→**1990**→...
MONTH: **1**→2→ ..... →12→**1**→...
DATE: **1**→2→ ..... →31→**1**→...
HOUR: **0**→1→ ..... →23→**0**→...
MINUTE: **00**→01→ ..... →59→**00**→...

- Repeat procedures **2** and **3** until all items have been set.
- Once the time and date are set, press the Shift Button in response to a precise time signal so hat the clock may begin to function.

Recording the Date/Time Indications

When the Date/Time Selector is pushed repeatedly, the indications will change in the following sequence:



Camera Recording

To Start Recording

1 Slide the Operation On/Off Switch to the right to turn the Movie Camera on.

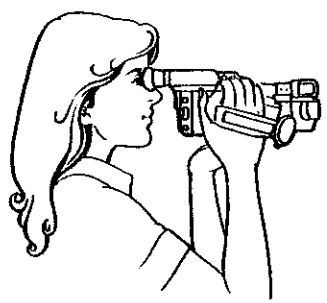
2 Set the Camera/VTR Selector Switch to "CAMERA REC".

3 Insert a video cassette with the erasure prevention tab intact.
- After a few seconds, the Movie Camera will be in the recording pause mode.

4 Set the Recording Speed Selector to "SP" or "LP".

5 Push the Full Auto Button.
The settings made in this way are indicated in the LCD Display as follows:
FOCUS: [A]
WHITE BALANCE: [A]
SHUTTER SPEED: [NOR]
TIMER: [OFF]
S-VHS: [A]

6 Place the Movie Camera in the shooting position.



- Grasp the Handgrip.
- Adjust the length of the Grip Belt.
- Attach the lens Cap to the Grip Belt.

7 Press the Start/Stop Button.
- The recording starts.
- The Tally Indicators are lit.

8 Press the Start/Stop Button again to stop the recording temporarily. (Recording pause mode)

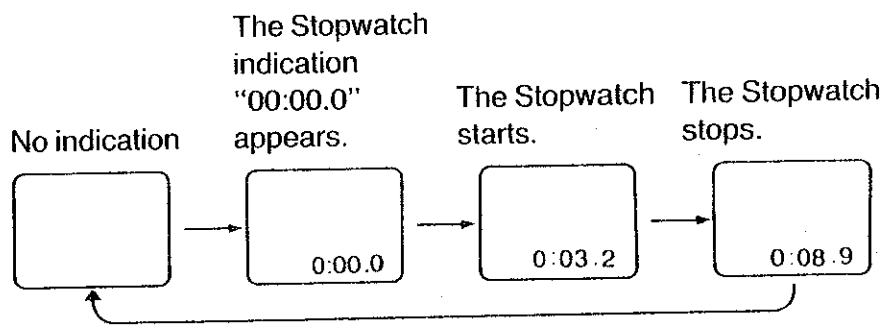
To Stop Recording

1 Put the Movie Camera in the recording pause mode.

2 Slide the Operation On/Off Switch to the right again to turn the Movie Camera off.

Recording of the Stopwatch

At every push of the Stopwatch Button, the indications in the EVF will change in the following sequence. The superimposed stopwatch works with 1/10-second precision.



- The Stopwatch can count up to 99 minutes 59.9 seconds.

Camera Search

For checking recorded scenes.

1 Put the Movie Camera in the recording pause mode.

2 Keep the Camera Search (−) Button pressed to play back a scene at high speed in reverse direction.

3 Keep the Camera Search (+) Button pressed to play back a scene at normal speed in forward direction.
- The sound is not reproduced.

Rec Review

For checking the last few seconds of recorded scenes.

1 Put the Movie Camera in the recording pause mode.

2 Press the Rec Review Button.

Self-Timer Recording

1 Put the Movie Camera in the recording pause mode.

2 After pressing the Mode Button five times, press the Set Button to select the "SELF 20S" or "SELF END" Indication on the LCD Display.
SELF 20S: to record for 20 seconds
SELF END: to record until the end of the tape

3 Press the Start/Stop Button.
- 10 seconds later, the Self-Timer Recording will start.
- Press the Start/Stop Button to stop the Self-Timer Recording midway.

Interval Recording

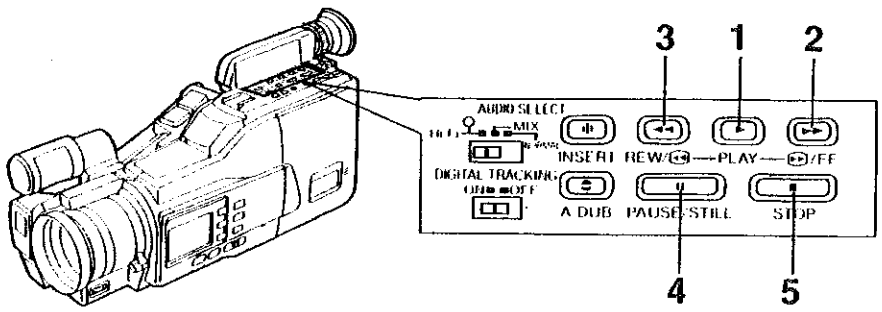
This function automatically makes recordings of approx. 1 second at 5-second intervals.

1 Put the Movie Camera in the recording pause mode.

2 After pressing the Mode Button five times, select "INTERVAL" with the Set Button.

3 Press the Start/Stop Button.
- Press this button again to stop the Interval Recording.

Playback



Preparation

- Slide the Operation On/Off Switch to the right.
- Insert the recorded cassette.
- Set the Edit Switch to "OFF".
- Select the playback sound with the Audio Selector Switch:

  HiFi: To reproduce the sound on the hi-fi sound track.
  NORMAL: To reproduce the sound on the normal sound track.
  MIX: To reproduce both the sound on the hi-fi and on the normal sound tracks.
- Set the Camera/VTR Selector Switch to "VTR PLAY".

Operations

1 Playback: Press the Play Button.

2 Cue playback: Keep the /FF Button pressed during playback.

3 Review playback: Keep the REW/ Button pressed during playback.

4 Still playback: Press the Pause/Still Button during playback.
- To return to normal playback, press this button again.

5 Press the Stop Button to finish playback.

Fast Forward

Press the ►►/FF Button to rapidly wind the tape forward.

Rewind

Press the REW/◄◄ Button to rapidly rewind the tape.

Tracking Control

Digital Tracking Switch

Set the Digital Tracking Switch to "ON" for normal use. (The tracking will be adjusted automatically.)
If the tracking is not adjusted properly, for example when playing back a tape recorded on another unit, set this switch to "OFF" and adjust in the following way:

1 Press both the Tracking ◄ and ► Buttons simultaneously.

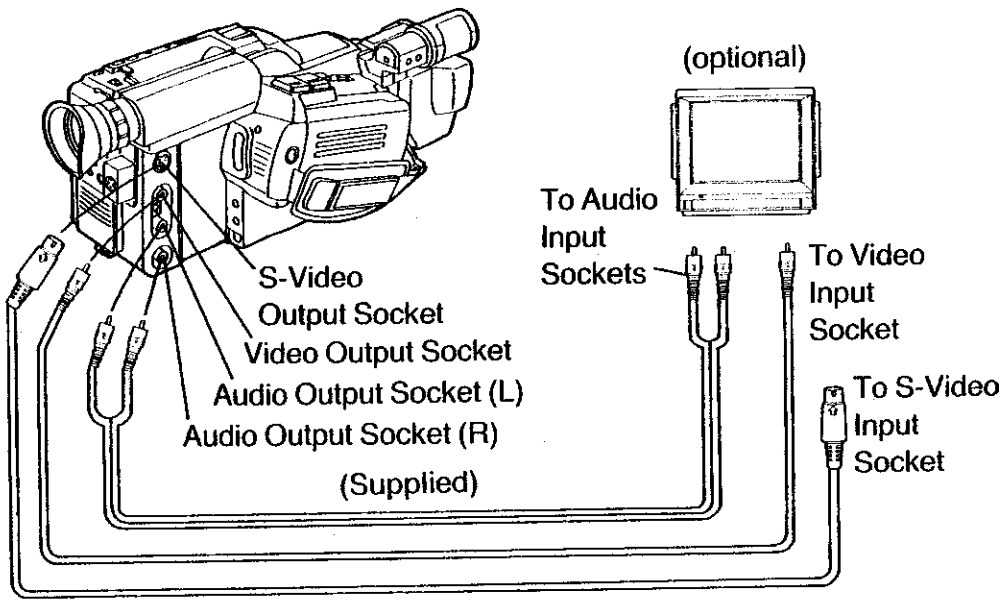
2 Adjust the Tracking with the Tracking ◄ or ► Button.

Note:

- The sound will be played back only during normal playback.
- Playback: The tape will be rewound automatically when it reaches its end.
- Fast Forward: The tape will stop automatically when it reaches its end.
- Rewind: The tape will stop automatically when it reaches its beginning.
- Still Playback: If the Movie Camera is left in this mode for about 6 minutes, it will switch over to the stop mode, to protect the tape and video heads.
- To ensure optimum sound reproduction, set the Audio Selector Switch to the position "Hi-Fi" for ordinary use.

Playback via TV Set (Connections)

TV Set with AV Input



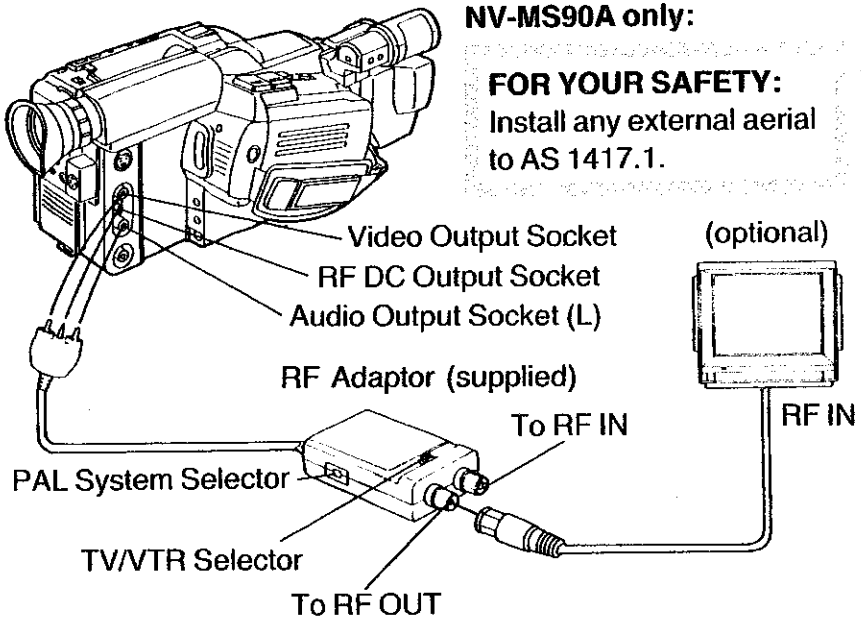
Playback via S-Video Cable

Connect this cable if the TV set is equipped with an S-Video Input Socket

Playback on a table Type VTR

Use the Cassette Adaptor.

TV Set without AV Socket



TV

Tune to UHF channel 36.

TV/VTR Selector on the RF Adaptor

VTR: For playing back a cassette.
TV: For watching TV.

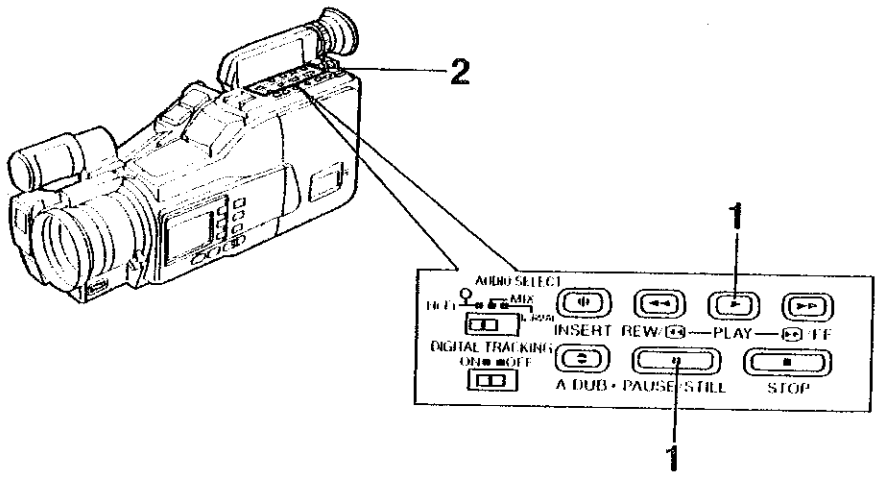
PAL System Selector

For the Australia and New Zealand region, set the RF Converter Channel Selector at "G" position.

Note:

When an RF Adaptor is used, the playback sound will be in mono.

Assemble Editing



Preparation

- Insert a video cassette with intact erasure prevention tab.
- Set the Camera/VTR Selector Switch to "VTR PLAY".

Operation

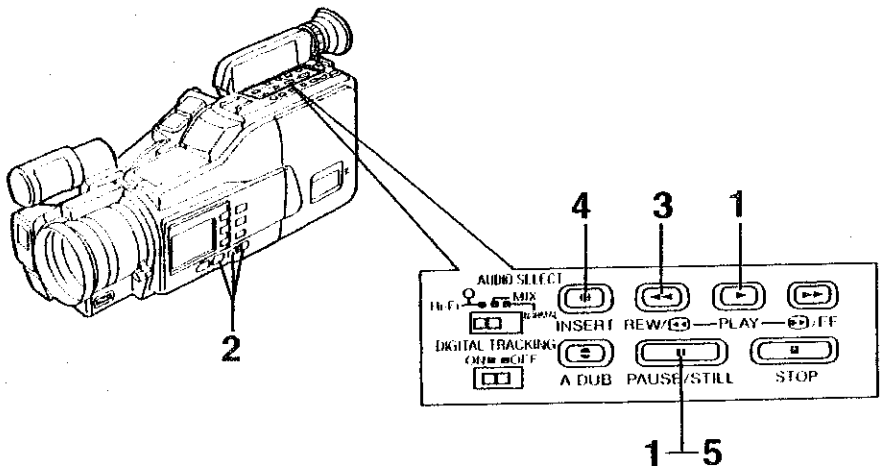
1 Play back the tape to locate the point where the new recording is to be joined (Assemble Editing), and press the Pause/Still Button at the desired point.

2 Set the Camera/VTR Selector Switch to "CAMERA REC".

3 Press the Start/Stop Button to start shooting the new scene.

Insert Editing

Replacing pictures and hi-fi sound on a recorded tape with new scenes and sound.



Preparation

- Set the Camera/VTR Selector Switch to "VTR PLAY".
- Insert the recorded video cassette with intact erasure prevention tab.

Operation

1 Play back the tape to locate the point where the Insert Editing is to finish, and press the Pause/Still Button at that point.

2 Press the Reset Button, and then the Mode and Set Buttons.
- The indication "M0000" appears in the EVF and LCD Display.

3 Press the REW/⏮ Button to locate the point where the Insert Editing is to start, and release the button at that point.

4 Press the Insert Button.

5 Press the Pause/Still Button.
- The Insert Editing starts.

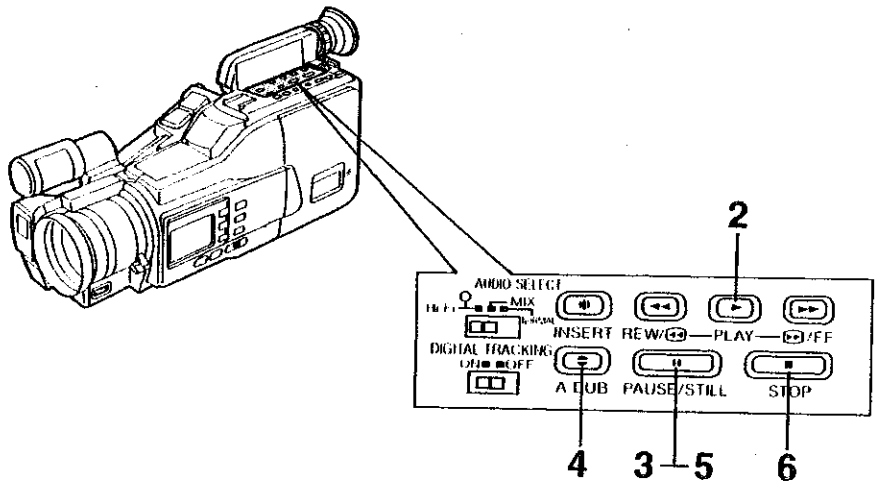
6 The Insert Editing will automatically finish at the point where the counter indicates "M0000".
- To stop the Insert Editing midway, press the Pause/Still Button.

Note:

- As the inserted sound has been recorded on the hi-fi audio track, set the Audio Selector Switch to "HiFi" for playback.
- It is not necessary to set the Recording Speed Selector and the S-VHS System Selector.

Audio Dubbing

Audio Dubbing (replacing the sound on the normal audio track) can be performed by using the built-in microphone or an external microphone.



Operation

1 Insert the recorded cassette.

2 Play back the tape to locate the point where you want to start the Audio Dubbing.

3 Press the Pause/Still Button at that point.

4 Press the Audio Dubbing Button.

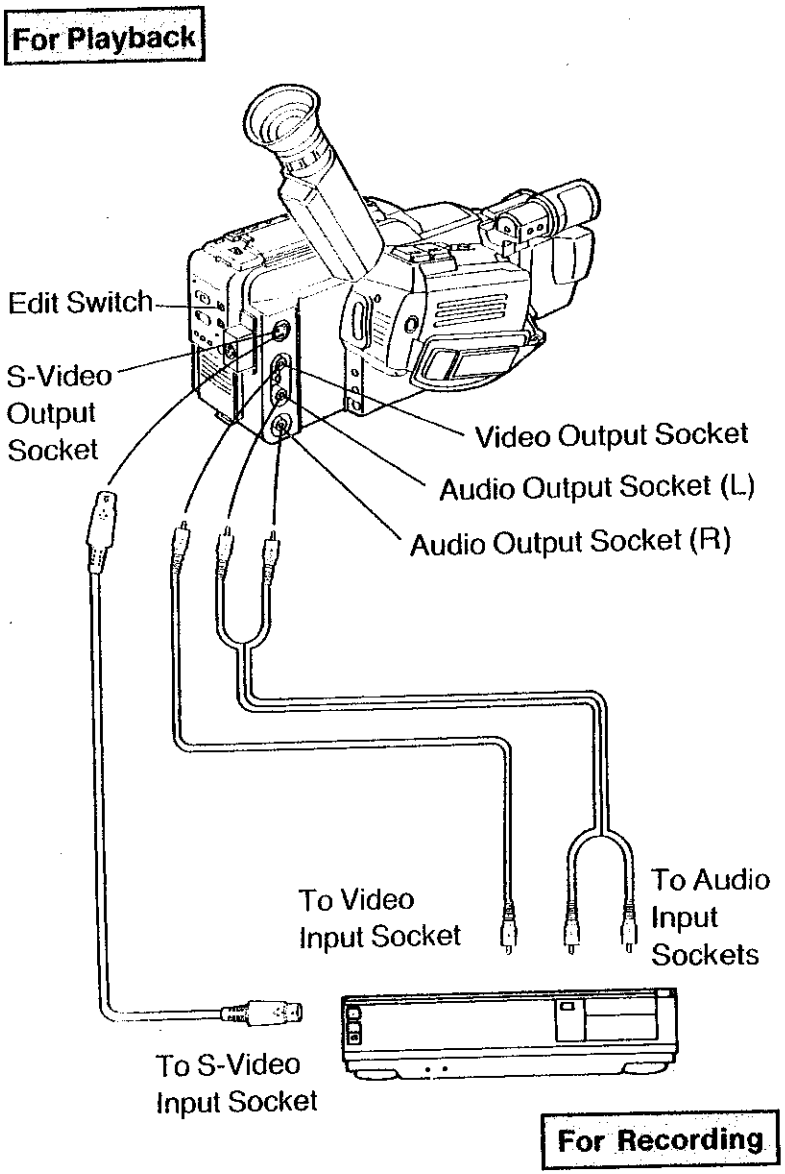
5 Operate the audio source unit and then press the Pause/Still Button.
- The Audio Dubbing starts.

6 Press the Stop Button to finish the Audio Dubbing.

Playing Back a Tape on Which Audio dubbing Was Performed

Set the Audio Selector Switch to "NORMAL".
- On the hi-fi track, the original sound remains unchanged.

Dubbing (Copying)



Operation

1 Set the Edit Switch to "ON".

2 Press the Play Button on the Movie Camera to start playback.

3 Press the Record Button on the VTR to start recording.

Note:
The picture quality of a copied tape is inferior to that of the original tape.

Dubbing with the S-Video Cable

Connect this cable, if the recording VTR is equipped with an S-Video Input Socket.

Synchro Editing

Use the Synchro Editing Cable (optional) to connect the Remote Control Socket on the Movie Camera with the synchro edit socket on the recording VTR.

- If the recording VTR is equipped with Synchro-Edit function, this Movie Camera can be operated via the recording VTR, i.e. playback start and stop of the Movie Camera will be synchronized with the recording start and stop on the VTR.
- For details, refer to the operating instructions of the recording VTR.

Focus

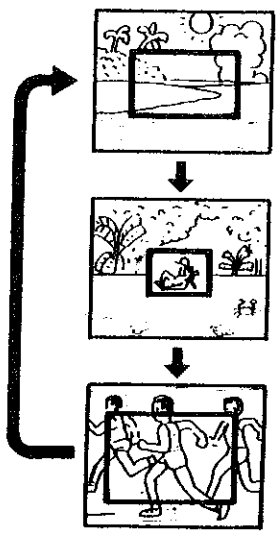
Continuous Auto Focus

1 After pressing the Mode Button two times, select the "A" indication in the LCD Display with the Set Button.

2 Aim the Movie Camera at the subject.
- The focus will automatically be adjusted to the subject within the focusing zone.

Focusing Zone Selection

- Press the Push Auto/Zone Selector Button.



For ordinary shooting.

For shooting a small subject.

For shooting moving subjects and for panning and titling.

Momentary Auto Focus

1 After pressing the Mode Button two times, select the "MANUAL" indication in the LCD Display with the Set Button.

2 Press the Push Auto Button.
- When the Movie Camera is in the manual focusing mode, momentary automatic focus adjustment can be obtained for as long as this button is kept pressed.

Manual Focus

1 After pressing the Mode Button two times, select the "MANUAL" indication in the LCD Display with the Set Button.

2 Turn the Focus Ring.

Note:

See page 42 for details.

White Balance

This adjustment is necessary to assure natural colour rendition.

After pressing the Mode Button three times, use the Set Button to select one of the three indications shown below for White balance adjustment.

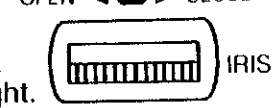
[A]: For continuous automatic White Balance adjustment.
IN: For shooting under light from incandescent light bulbs or halogen lamps.
OUT: For shooting under sunlight.

Note:
See page 42 for details.

Iris

Centre click position: Automatic adjustment

Turn to OPEN: When the subject is backlit.
Turn to CLOSE: When the picture is too bright.



High Speed Shutter

A range of different shutter speeds make possible videographing of scenes with fast movements.

After pressing the Mode Button four times, use the Set Button to select one of the six indications for the desired shutter speed.

[NOR]: 1/50 sec. (normal)
120: 1/120 sec.
250: 1/250 sec.
500: 1/500 sec.
1000: 1/1000 sec.
2000: 1/2000 sec.

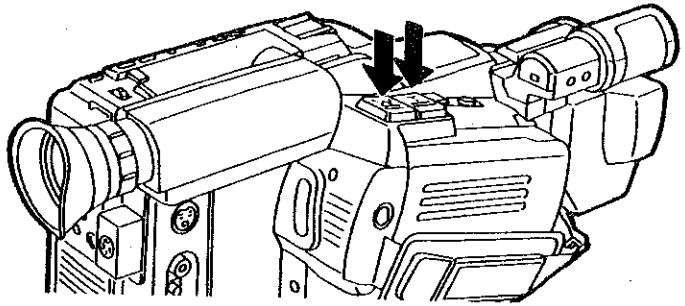
For Playback

When scenes recorded with high shutter speed(s) are later played back on a VTR equipped with the playback functions Super Still and Super Fine Slow Motion, etc., still and slow motion pictures with very sharp contours and full details can be obtained.

Note:
See page 42 for details.

Zooming

Power Zooming

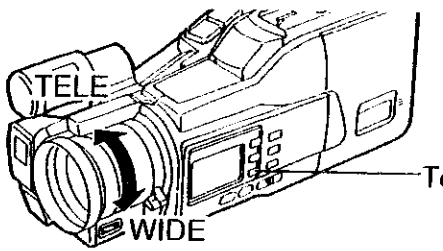


For wide-angle: Press the "W" Button.
For telephoto: Press the "T" Button.

- For faster zooming speed, press them down more strongly.

Manual Zooming

Turn the Manual Zoom Lever.



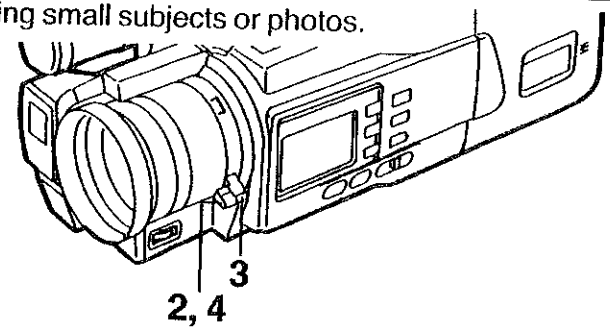
Telephoto Button

The Telephoto Button lets you enlarge a subject in the middle of the EVF to about twice its size. This makes it possible to immediately double the telephoto effect at any setting of the zoom lens for as long as this button is being pressed.

- When shooting with the Electronic Zoom function, the Auto Focus does not work and the picture will become grainy.

Macro Close-Up

For shooting small subjects or photos.



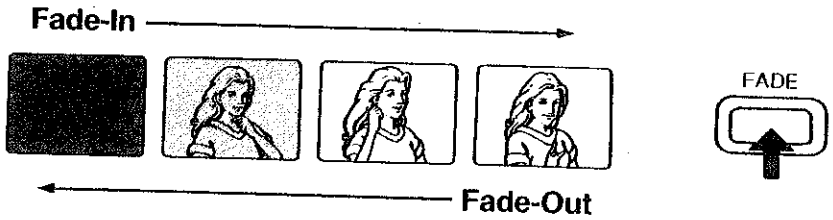
1 After pressing the Mode Button three times, press the Set Button until the "IN" (Indoor) or "OUT" (Outdoor) Indication appears in the EVF and in the LCD Display.

2 Turn the Zoom Lever all the way down to the click stop.

3 Press the Macro Button and turn the Zoom Lever further down.

4 Turn the Zoom Lever slowly and focus on the subject.

Fade-In and Fade-Out



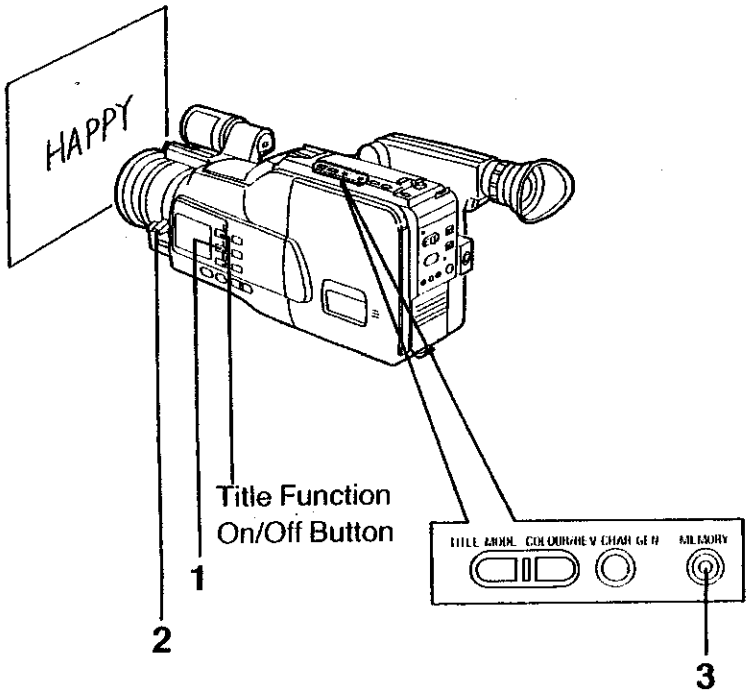
Fade-out: Keep the button pressed.
Fade-in: Release the button.

Recording Titles

The titling function makes it possible to input several titles into memory and recall them later during shooting at the push of a button for superimposition onto the normal picture (Digital Title Memory Function).
The memory can hold 2 title pages (2 pictures).

Inputting a Title into Memory

This operation can be performed while the Movie Camera is in the recording pause or stop mode.



1 Press the Title Page Selector Button to select the page ("1" or "2") on which you want to store the title.

2 Use the Macro function to adjust the focus when shooting a small written, printed or painted title.

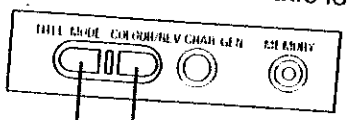
3 Press the Memory Button.
- Keep the button pressed for more than half a second.
- The title is memorized.
  While the title is displayed in the EVF, its colour and the titling mode (the way it will be superimposed) can be selected. (See next page for details.)
- Press the Title Function On/Off Button to erase memorized titles.

■ Remarks about Titling

The title remains stored in memory until the lithium battery is exhausted. When a new title is input, the title previously memorized on that title page will be erased.

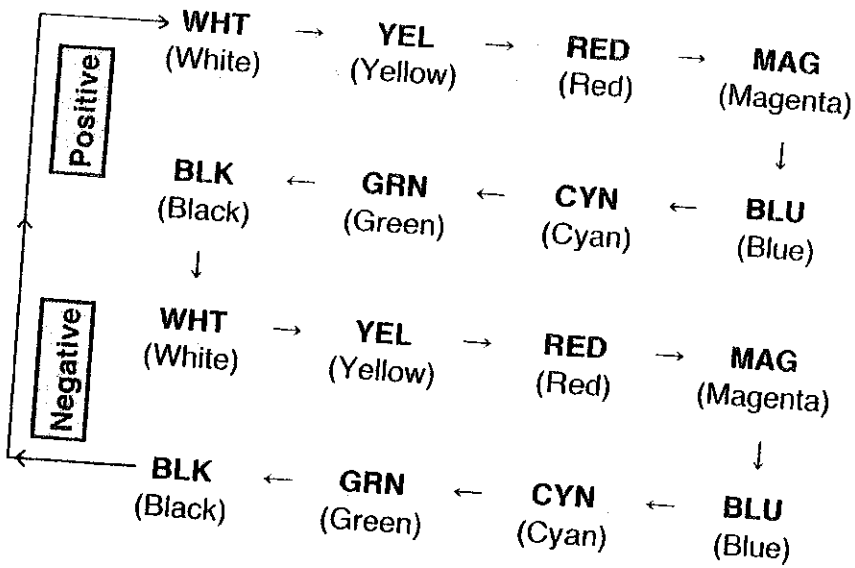
Selecting the Colour of a Title

By repeatedly pressing the Title Colour/Colour Reverse Selector Button, the colour of the title can be changed in the following order. (This function can also be used while the title is being recorded.)



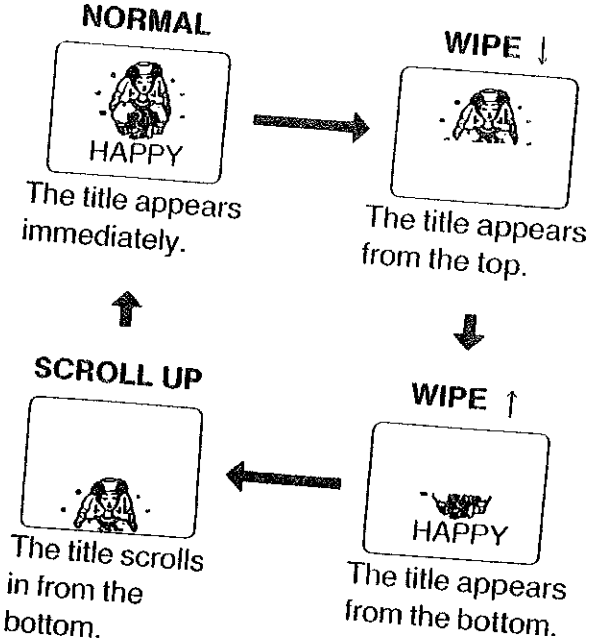
Titling Mode Selector Button

Title Colour/Colour Reverse Selector Button



Selecting the Titling Mode

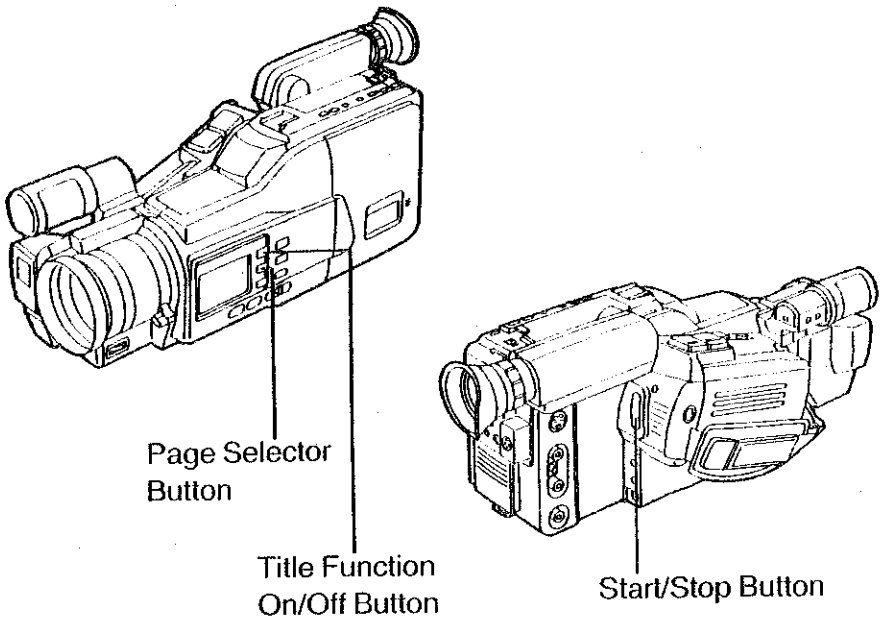
By repeatedly pressing the Titling Mode Selector Button, the way in which the title is superimposed onto the picture being recorded can be changed in the following order. (This function can also be used while the title is being recorded.)



When pressing the Title Function On/Off Button, the Title is indicated in the selected mode.

- If another title is indicated, press the Title Function On/Off Button to erase it and then indicated a new title again.

Recording a Title



■ Inserting a Title in the Normal Titling Mode at the Beginning of a Recording

1 Press the Page Selector Button to select the title page to be superimposed.

2 Press the Title Function On/Off Button to make the title appear in the EVF.

3 Press the Start/Stop Button to start shooting.
- To stop the superimposition of the title, press the Title Function On/Off Button again.

■ Inserting a Title in the Normal Titling Mode during Recording

1 Press the Page Selector Button to select the title page to be superimposed.
- After confirming that the selected page holds the desired title, turn off the title function by pressing the Title Function On/Off Button.

2 Press the Start/Stop Button to start shooting.

3 At the point where you want to insert the title, press the Title Function On/Off Button. (The superimposed title can be seen in the EVF.)
- To stop the superimposition of the title, press the Title Function On/Off Button again.

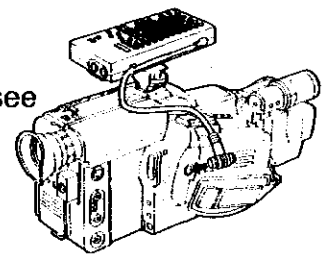
■ Inserting a Title in the Scroll or Wipe Mode at the Beginning of a Recording

Perform the operation steps 1 and 2 above. After pressing the Start-/Stop Button, wait approx. 2 seconds and then press the Title Function On/Off Button.

Composing Titles with the Character Generator (optional)

Title input with the optional Character Generator is possible.

- For attaching the Character Generator, see page 35.

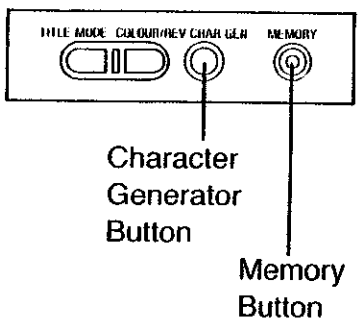


1 Turn the Movie Camera on.

2 Operate the Character Generator.
- For the operation for the Character Generator, read its operating instructions.

3 Press the Title Page Selector Button to select the page on which you want to store the title.

4 Press the Memory Button for more than half a second while keeping the Character Generator Button pressed.



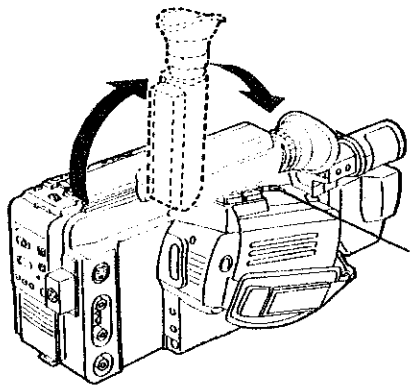
■ Caution

- It is not possible to display a title page from the Movie Camera memory and a title from the Character Generator at the same time.
  When displaying a title directly from the Character Generator on the EVF, press the Title Function On/Off Button to remove the Movie Camera title from the EVF screen.

Electronic Viewfinder

For Low-angle Shots

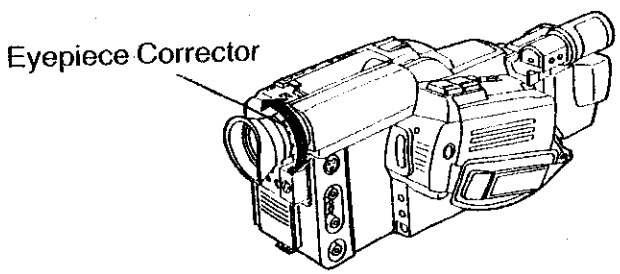
The Electronic Viewfinder can be turned upward and forward by a maximum of 180°. This is convenient for taking low-angle shots.



This Start/Stop Button is convenient for low-angle shots.

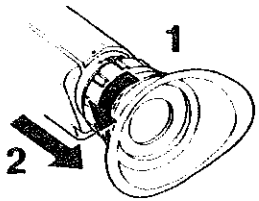
Eyepiece Corrector

This control makes it possible for people who wear glasses to adjust the eyepiece to their eyesight.

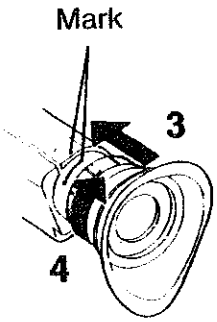


For Viewing the EVF with the Left Eye

- Turn the Eyecap counterclockwise to remove it.



- Turn the Eyecap so that its longer side faces left. Align the marks, and insert and turn the Eyecap clockwise until it locks with a click.



Other Functions

Recording Speed Selector

- **SP:** For normal tape speed
- **LP:** For slow tape speed

Memory Search Function

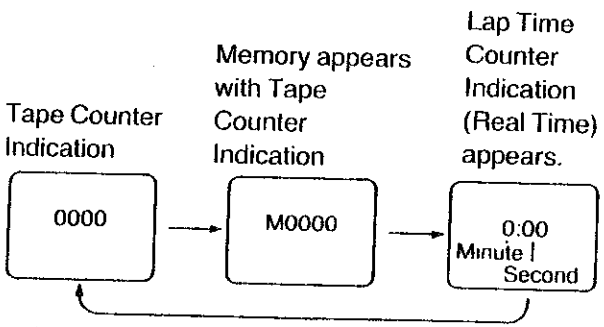
1 Press the Reset Button at the desired point.
- The Tape Counter is reset to "0000".

2 After pressing the Mode Button once, press the Set Button.
- The "M" indication appears in the EVF and in the LCD Display.

3 After pressing the Stop Button, press the Rewind/Review Button.
- The tape will stop automatically at about the point where the tape counter reads "0000".

Counter Indication

After pressing the Mode Button once, the Counter indication will change in the following order at every push of the Set Button.



- The indication of the Lap Time Counter counts up only during recording.
- To delete the counter indication in the EVF, press the On Screen Display Button. To make this indication appear again, press this button once more.

Remaining Tape Time Indication

During recording, playback, insert editing, and audio dubbing, the remaining tape time is indicated in minutes. When the remaining tape time becomes less than 2 minutes, the indication will flash.

Tape Selector Button (EC45)

When using cassette tapes with long recording time (45 minutes in SP mode, 90 minutes in LP mode), press the Tape Selector Button so that the small green lamp above it starts to light. When the cassette is ejected, the lamp will go out.

Filter Selector

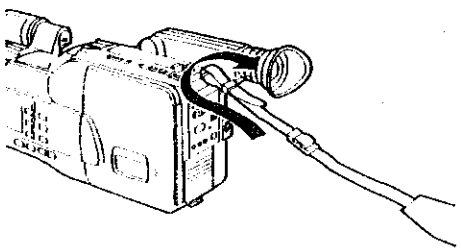
OFF: For normal sensitivity
ON: For increased sensitivity

- Do not change the setting of this switch during recording, otherwise the sound will be interrupted for a few seconds.

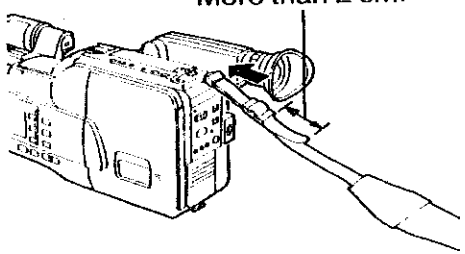
Accessories, etc.

Shoulder Strap

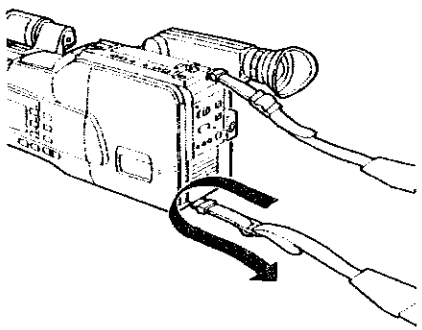
1



2



3



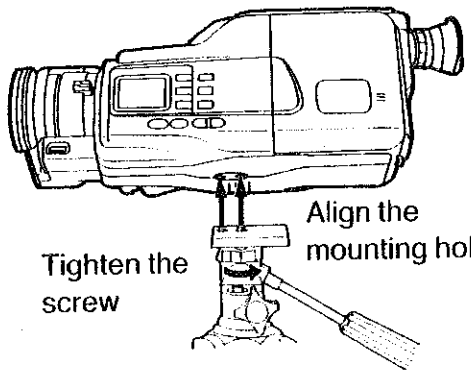
1 Pull the end of the Shoulder Strap through the slit of the upper Shoulder Strap Holder.

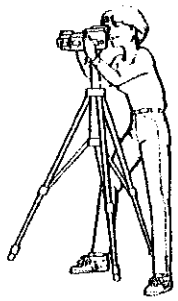
2 Securely attach the end of the strap.

3 Attach the other end of the Shoulder Strap at the lower holder in the same way as mentioned above.

Tripod Mount

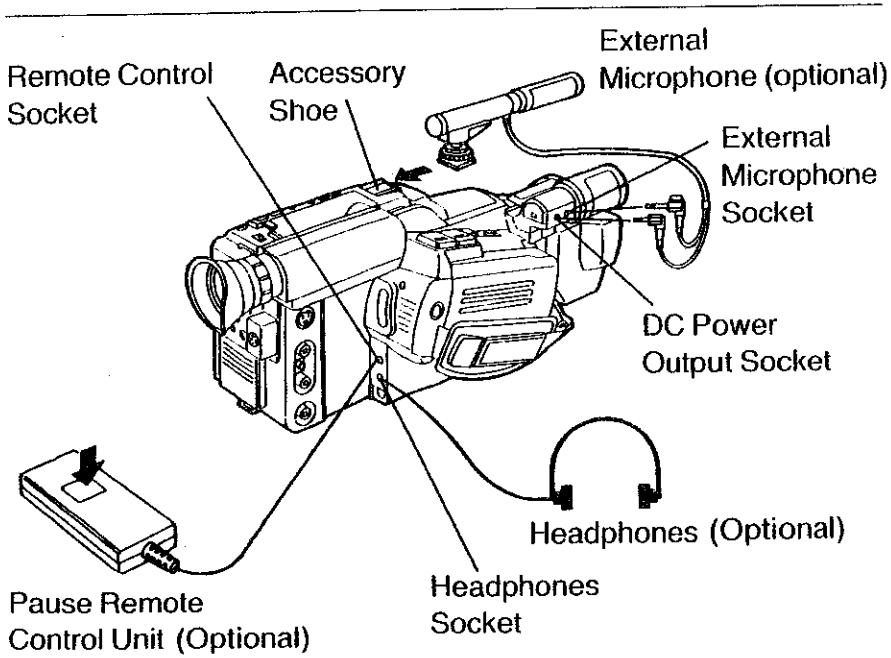
Bottom side of the Movie Camera



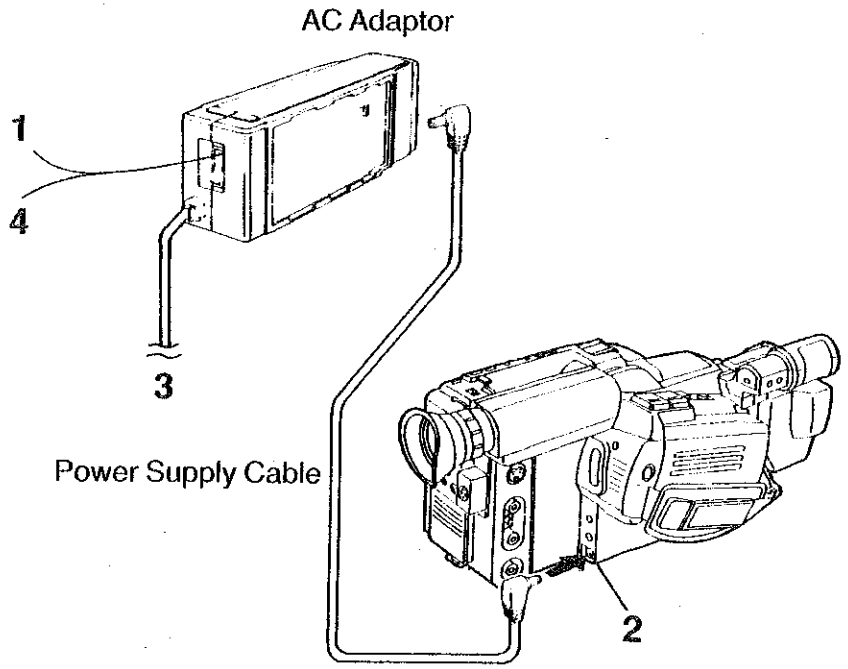


- Place the tripod on a stable surface, with its legs fully spread.

Other Connections



AC Adaptor



1 Turn off the power.

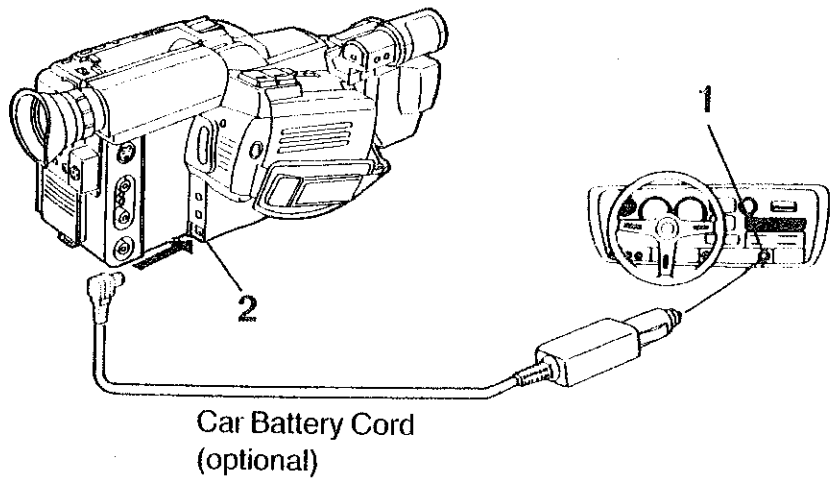
2 Connect the Power Supply Cable from the DC Output Socket on the AC Adaptor to the DC Input Socket on the Movie Camera.

3 Connect to the Mains.

4 Turn on the Power.

Note:
When a Battery Pack is attached to the AC Adaptor, the Movie Camera cannot be supplied with power.

Car Battery Cord (Optional)



1 Start the engine and insert the Car Battery Cord into the cigarette lighter socket.

2 Connect the other end to the DC Input Socket on the Movie Camera.

Note:
- The Car Battery Cord can only be used with 12V DC negative-grounded vehicles.
- Do not start the car engine while the Movie Camera is powered by the car battery.

Character Generator (Optional)

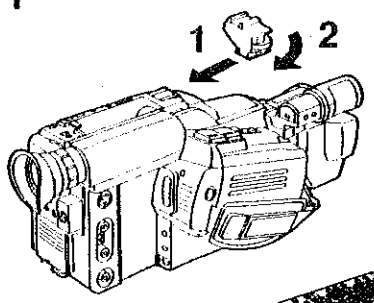
The use of the optional Character Generator makes it possible to record titles, time, date and stopwatch while shooting.

Attaching

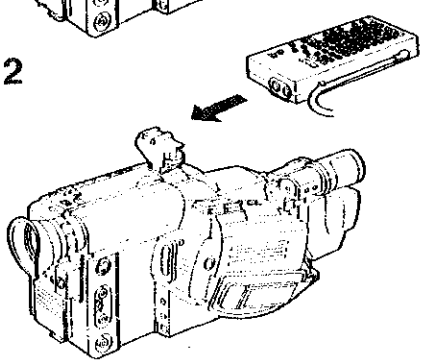
Use the Shoe Adaptor that is supplied with the Movie Camera.

- Before attaching the Character Generator, turn the Movie Camera off.

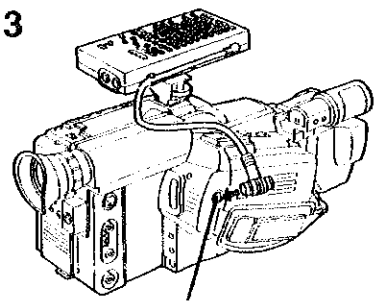
1



2



3



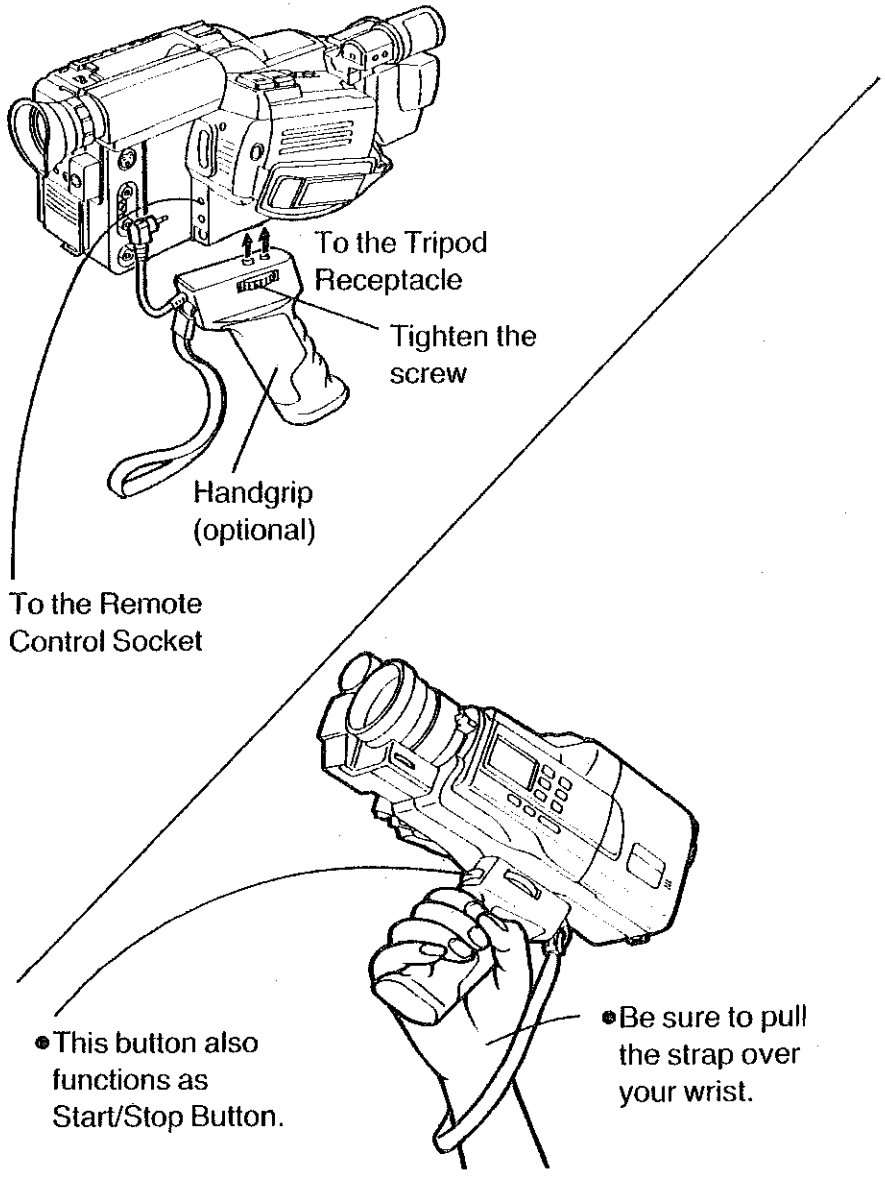
1 Attach the Shoe Adaptor and tighten the screw.

2 Attach the Character Generator to the Shoe Adaptor.

3 Insert the plug of the Character Generator Cord into the Character Generator Terminal.

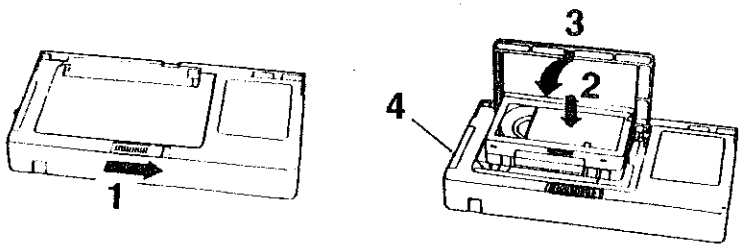
- For the operation of the Character Generator, see the operating instructions of the Character Generator.

Handgrip (Optional)

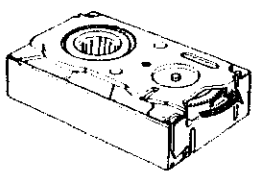


Cassette Adaptor

Loading the Cassette



Before loading the cassette into the Cassette Adaptor, turn the cog wheel in the direction of the arrow to pull in the slack of the tape.



1 Slide the Open Button in the direction of the arrow, and the Compartment Cover will pop open.

2 Insert the Cassette vertically.

3 Close the Compartment Cover firmly.
(Tape loading starts automatically. During loading, do not touch the rotating part on the underside of the Cassette Adaptor.)

4 The Stopper is retracted.
(When the Stopper is completely retracted, the tape loading in the Cassette Adaptor is completed. It can now be inserted into a VHS video recorder.)

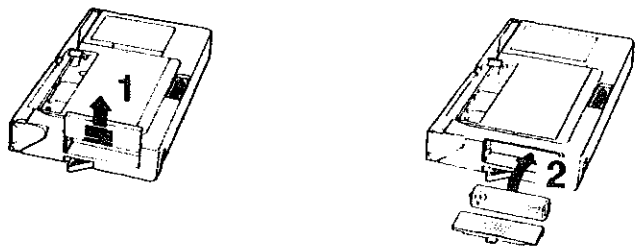
Taking Out the Cassette

1 Slide the Open Button in the direction of the arrow.

2 Take out the cassette.
- Pushing the cassette from the underside of the adaptor will make it easier to take it out.

3 Close the Compartment Cover.

How to Load the Battery



1 Slide the Battery Cover upward and remove it.

2 Load one "R6" size battery with the polarities correctly aligned and replace the cover by pushing it down until it locks with a click.

CAUTION FOR BATTERY REPLACEMENT
- If the tape loading time is getting longer, the battery is becoming exhausted. Replace it with a new one.
- Load the new battery with its polarities (+ and −) aligned correctly.
- Remove battery immediately and dispose of it.

S-VHS-C Format

This format ensures high resolution and high picture quality by using high performance S-VHS-C video cassette tapes.

For Recording
When using S-VHS-C cassettes, after pressing the Mode Button six times, use the Set Button to select one of the two indications in the LCD Display for the desired format.

[A]: Auto position:
- On S-VHS-C cassettes, recordings will automatically be made in the S-VHS-C format.
- On VHS-C cassettes, recordings will automatically be made in the VHS format.

OFF: For recording in the conventional VHS format on an S-VHS-C cassette.

When using VHS-C cassettes, the recording is made in the VHS format irrespective of the selected recording format.

For Playback
It is not necessary to select the format.

Note:
If a cassette recorded in S-VHS is played back on a conventional VHS Movie Camera or VTR, it is not possible to obtain a playback picture.

Hi-Fi (Stereo) Sound

Stereo sound can be recorded on the hi-fi audio track via the built-in stereo microphone. At the same time, mono sound is recorded on the normal sound track, making it possible for a tape recorded on this Movie Camera to be played back on a mono-type Movie Camera or VTR.

Index Signal (VISS)

The recording of index signals at the beginning of and during recordings makes possible the use of the VHS Index Search or the Intro Scan function when playing back the tape on a VTR equipped with these functions.

An index signal is recorded when one of the following operations is performed.

- When recording is started for the first time after the Movie Camera is turned on.
- When recording is restarted after the cassette is exchanged or the tape is played back.

In each of these cases, the "INDEX" indication will flash for a few seconds in the EVF.

- When recording index signals, space the signals at least 5 minutes in the LP mode and 2 minutes in the SP mode.

Cautions

Please read these cautions before operating the System.

Video Head Clogging

The video heads are the means by which the System places picture signals on the tape during recording, and reads picture signals from the tape during playback. If these heads become dirty and clogged from long use, the signals can no longer be recorded correctly, and the playback picture will be distorted accordingly. This is the case, for example, during the playback of a tape, the sound of which is reproduced normally, but no picture is seen, or the picture is greatly distorted. When such symptoms occur, have the System checked by qualified service personnel.

The System is equipped with head clogging detection function. When the heads are clogged, the ⊗ Indication in the EVF will appear. As the accumulation of dirt on the heads may be dislodged by the movement of the tape, it is possible that this indication sometimes appears, but may not reappear on the next recording starts.

The head clogging detection function will be activated when the shooting is started from the recording pause mode. However, it will not be activated when shooting immediately after replacing the cassette and after performing Camera Search or Playback.

If Condensation Forms Inside the Movie Camera

Condensation (dew) forms when warm air comes in contact with a cold object, for example on a window in a heated room in winter. Condensation may form in the Movie Camera and damage the tape and the video heads, if:

- The System is in a room where the heater has just been turned on.
- The System is in a room with steam or high humidity.
- The System is brought from cold surroundings into a well-heated room.
- The System is suddenly brought from cool surroundings, such as an air-conditioned room or car, to a place which is hot and humid.
- When condensation has formed inside the System, the "DEW" indication in the EVF will flash and a few seconds later, the unit will turn itself off to protect the tape and the video heads. After a while, turn the unit on again and make sure that the Dew Mark is not displayed any more. Then, wait about 1 hour before operating the System again. Depending on the surrounding conditions, it may take several hours before the System can be used again.
- As condensation forms gradually, it may take about 10–15 minutes before the System turns itself off after a change of working environment.
- In an extremely cold place, condensation may freeze and turn into frost. In this case, it may take quite some time for the frost to melt, turn into dew and evaporate.
- When you bring the System from a very cold place, e.g. the ski slopes, into a heated room, keep it in a tightly closed plastic bag or similar to prevent condensation from forming inside the System.

Keep the System sway from Oily Smoke and Steam

Protect the System from Humidity and dust

Surrounding Conditions

Use the System under conditions where the temperatures are between 0°C and 40°C, and where the humidity is between 20% and 80%. To avoid deformation of the outer case or other damage, do not leave it exposed to direct sunlight for any length of time, also never leave it in a closed automobile.

Keep the System sway from Heaters

Keep the System sway from TV Sets

Do not place the System near a TV set because it might impair the picture and sound quality of the recorded tape, and/or adversely affect the performance of the Movie Camera.

Keep Magnets Away

Never bring a magnet or magnetized object such as fluorescent lamps, motors, electric clocks and battery operated toys etc. close to the System.

Keep the System away from Areas with Strong Electric Fields

The picture may become distorted, when the System is used in places with strong electric fields, such as near TV or radio antennas.

Never Put any Objects Inside

Never insert any object other than a video cassette into the System. If any object is dropped into it or if any liquid is spilled into it, consult qualified service personnel. Operating it with some foreign matter inside may cause fire or electric shock.

Not Fingers Inside

Touching internal parts of the System is very dangerous and may cause serious damage to the System. Do not attempt to disassemble it. For internal inspection, adjustment or repairs, consult qualified service personnel.

Handle with Care

Never drop the System or expose it to strong physical shocks. Shocks during use may result in abnormal operation and performance.

Appearance of Smear Distortion

Smear distortion is a peculiar characteristic of the CCD device. It appears as a bright vertical stripe on the screen when the System is aimed at spot lights or other bright light and light reflecting objects. To avoid this problem, make sure not to aim the System at such strong light source during shooting.

Cover the Lens with the Cap after Shooting

Keep the System away from Strong light

Do not expose the System to strong light, because the heat from it may cause deformation or other damage.

When the System Is Not Being Used

Remove the video cassette and turn the System off with the Operation On/Off Switch.

Never Place the System with the Cassette Compartment Side Facing Down

Never use the System with the cassette compartment facing down as this might cause uneven winding and slacking of the tape.

Cleaning the VTR

Wipe the VTR with a clean, dry cloth. Never use cleaning fluid, or other chemicals.

- Clean the lens only with a blower brush (used for photo cameras) or a special lens cleaning tissue (used for glasses and cameras).

For Cassette Adaptor

- Do not insert this Cassette Adaptor into a VTR and take it out again without running the tape, because this could cause the tape to get loose.
- When loading the cassette into the Cassette Adaptor, be careful not to touch the tape directly. After use, take out the cassette from the Cassette Adaptor.
- Never insert the Cassette Adaptor into a VTR without a video cassette in it.

For AC Adaptor

- Do not place heavy objects on the unit.
- When unplugging the main cord or other connection cords, be sure to grasp the plug, not the cord.
- When listening to a radio while the AC Adaptor is in operation, the radio reception may be distorted. In this case, move the radio away from the AC Adaptor.

For Battery Pack

Be sure to charge the Battery Pack before using it.

Pay attention to the following points to avoid danger.

- Do not throw the Battery Pack into fire.
- Do not short-circuit the poles of the connector.
- Do not disassemble or reconstruct the Battery Pack.
- Use only the supplied AC Adaptor to charge the Battery Pack.

Follow the instructions below to avoid damage to the Battery Packs or reduction of their service life.

- Never subject the Battery Pack to strong shocks or drop it.
- Do not recharge a Battery Pack that is already fully charged.
- During operation of the System or during recharging, the Battery Pack may become warm however this does not pose any problem.
- The service life of a Battery Pack has its limits. If the operation time of a Battery Pack in spite of normal recharging becomes so short that its normal use for shooting is no longer possible, it should be replaced with a new one.

The function of the Battery Pack is based on a chemical reaction. Use it according to its characteristics.

- Charge the Battery Pack within a temperature range of 10°C–35°C. If charged at lower temperatures, the chemical reaction cannot take place optimally, causing the performance of the Battery Pack to deteriorate. At higher temperatures, the Battery Pack cannot be charged completely.
- Store the Battery Pack in cool and dry place. If exposed to high temperatures for a long time, the battery life will be shortened and the self-discharging process will be increased.
- Charge the Battery Pack before using it because self-discharging may occur if it has not been used for a long period of time.
- When not using the Battery Pack, remove it from the Movie Camera or the AC Adaptor.

For Auto Focus

The Auto Focus System will not provide stable and accurate focus adjustment if you are shooting:

1. A subject behind dirty glass.
2. Shiny surfaces. (The focusing zone frame may disappear.)
3. A subject with a part of it near and another part far from the Movie Camera.
4. An oblique subject.
5. A subject with horizontal stripes.
6. A flat surface, e.g. a white wall.
7. With the macro close-up function, special lenses or filters.
8. A fast-moving subject.
9. A subject having a dark surface. (The focusing zone frame may go on and off.)

In these cases, use manual focusing.

Note:
This Auto Focus System does not measure the actual distance but adjusts the lens to the optimum focusing condition based on the video signal. Therefore, the distance setting on the lens may be different from the actual distance in some cases. However, this is not an indication of a malfunction.

For White Balance

The Auto White Balance Adjustment may not be accurate when:

1. The illumination on the subject is different from the light falling on the Movie Camera.
2. Either the Movie Camera or the subject is in the shade.
3. Intense lighting is used, e.g. from a mercury-vapour, natrium or fluorescent lamp.
4. The illumination is not bright enough (less than approx. 15 lux).
5. The illumination of the scene is red-coloured, e.g. during sunrise or sunset.
6. Intensive light falls only on the red or blue light sensor in the window.
7. There are other light sources outside the sensing range of the white balance adjustment sensors, e.g. snowy landscape, cloudy weather. Incandescent light or candlelight.
8. Some object is placed before the sensor window preventing light from reaching it.
9. Shooting in the macro range. The Auto mode does not operate. In this case, set the "IN" or "OUT" position.

For High Speed Shutter

The following conditions are required for shooting with the High Speed Shutter function:

- The subject must be brightly lit, with little shade, under sunlight or some other illumination of more than 300 lux.
- If shooting under the illumination produced by fluorescent lamps, the picture will be adversely influenced by flickering.
- If the picture is played back in the normal playback mode, the movements may appear to be not very smooth.
- The playback picture will be slightly darker than the picture recorded without using the High Speed Shutter function.

Before Requesting Service

Power Source

- The power does not turn on.
  —Is the power supply unit correctly connected to the Movie Camera?
- The power turns on, but it turns off again immediately.
  —If the Battery Pack is exhausted, replace it with a fully charged one.
  —If condensation has formed, wait until it has dissolved.

Camera Recording

- The power is on, but no picture appears in the EVF.
  —Is the lens covered with the lens cap?
- Camera recording cannot be performed.
  —If the tab of the cassette is broken out, cover the tab hole with adhesive tape.
- The picture is not clear.
  —Is the eyepiece correctly adjusted to your eyesight?
  —Is the lens surface dusty?
- The Auto Focus System does not provide optimum focus adjustment.
  —Is the Focus Mode Selector set to "AUTO"?
  —For shooting conditions where the "AUTO" setting of the Focus Mode Selector cannot provide optimum focus adjustment, set the selector to "MANUAL" and adjust the focus.

Playback

- No playback picture is reproduced.
  —Is the connection to the TV set correct?
  —Is the TV set tuned to the video playback channel?
- The colours are not correct.
  —Is the colour adjustment of the TV set correct?
- The playback picture is not in colour.
  —Adjust the Tracking.
  —If the tape is old, use a new tape.

Specifications

NV-MS90A, EA

Information for your safety

Power Source:	DC 9.6 V	
Power Consumption:	Recording mode; 10.3 W (Battery Operation)	
Video Recording System:	Rotary four heads, helical scanning system	
Tape Speed:	SP; 23.39 mm/s	
	LP; 11.7 mm/s	
Tape Format:	S-VHS-C/VHS-C tape	
Recording/Playback Time:	45 min. with NV-SEC45 (SP) -EC30HG	
	90 min. with NV-SEC45 (LP)	
VIDEO		
Television System:	CCIR; 625 lines, 50 fields PAL colour signal	
Modulation System:	Luminance; FM azimuth recording	
	Colour signal; Converted subcarrier phase shift recording	
Output Level:	VIDEO OUT (PHONO); 1.0 Vp-p,	75 ohm unbalanced
	S-VIDEO OUT Terminal; 1.0 Vp-p,	75 ohm unbalanced
AUDIO		
Input Level:	MIC IN (M3); −70 dB,	4.7 kohm or more unbalanced
Output Level:	AUDIO OUT (PHONO); −8 dB,	600 ohm unbalanced
Audio Track:	1 track (Normal-Mono only), 2 channels (Hi-Fi Sound-Stereo)	
Image Sensor:	½-inch CCD Image Sensor	
Lens:	8: 1 2-Speed Power Zoom Lens with MACRO Auto Focus Function	
	Auto Iris	
	Auto Focus System F1.2 (8.5—68 mm)	
	Filter Diameter 49 mm	
Viewfinder:	⅔-inch Electronic Viewfinder	
Standard Illumination:	1.400 lux	
Minimum Required Illumination:	9 lux	

Video Horizontal Resolution (Colour):	S-VHS; More than 400 lines (S-Video OUT) (SP) VHS; More than 250 lines (SP)
Signal-to-Noise Ratio:	Video; More than 43 dB (SP) Audio (Hi-Fi); More than 47 dB (SP) (Normal); More than 43 dB (SP)
Audio Frequency Response:	Hi-Fi; 50–20,000 Hz (SP) Normal; 80–8,000 Hz (SP)
Operating Temperature:	0°C–40°C
Operating Humidity:	20%–80%
Weight:	Approx. 1.6 kg (without Battery Pack)
Dimensions:	128 (W) × 140.8 (H) × 349 (D) mm

VW-AMC2A Information for your safety

Power Source:	AC 100–240 V, 50–60 Hz (Automatic voltage adjustment)
Power Consumption:	25 W
DC Output:	DC 9.6 V 1.2 A (Movie Camera) DC 9.6 V 0.86 A (Battery Pack charging)
Weight:	Approx. 0.56 kg
Dimensions:	53 (W)×68.5 (H)×191 (D) mm

Weight and dimensions shown are approximate.
Specifications are subject to change without notice.